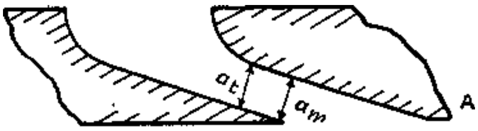
value. The explanation of this appears to be that when saturated steam expands very rapidly it momentarily assumes an unstable or supersaturated condition in which the temperature falls below the saturation temperature corresponding to the pressure, but condensation does not fully occur.



In other words, the steam instantaneously behaves like superheated steam, and more

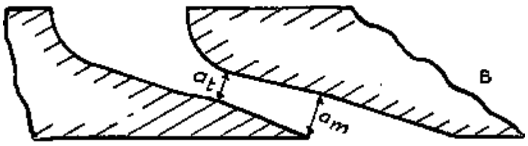


Fig. 5.«.Nozzle Forms

or less follows the law $PV^{1 \cdot 3}$ = constant.

Fig. 5 indicates the two forms of nozzles employed in practice.

A is nozzle employed where the ratio $\frac{P}{P_1}$ is not less than about 0-5. In this case (throat area a_t) = (mouth area a_m), and these areas are calculated from the velocity derived from equation (2), page 145.

B is nozzle employed where the ratio $\frac{P}{P_1}$ is less than 0*5. In this case

(throat area a_t) is less than (mouth area a_m), and throat area is calculated by equation (3), p. 148, whilst mouth area by equation (2).

BL **The Impulse Blade.**—In the impulse type of turbine the whole of the expansion energy of the steam is converted into kinetic energy in stationary nozzles from which the steam is directed into the moving blading, and consequently the passage through the moving blading occurs without pressure

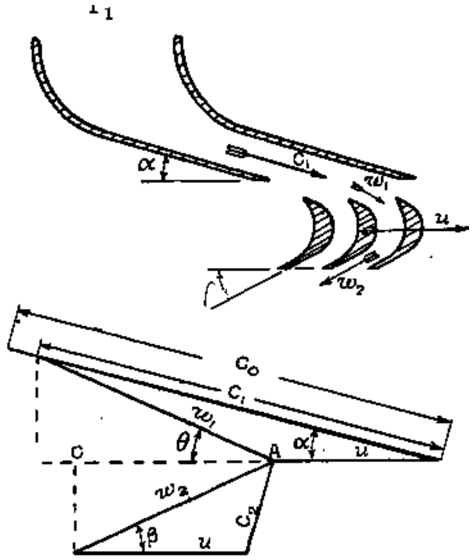


Fig. 6.—Velocity Diagram for Simple Impulse Turbine

drop.

Fig. 6 shows a single stage of a simple impulse turbine, and the vector diagram repre-senting the steam velocities.

Steam leaves the nozzle having an angle of inclination a at a velocity C_v Subtracting from this the speed of the blading *u*, the relative velocity w^

at which the steam enters the blading is obtained. In passing through the blading frictional losses reduce the velocity to w_2, and it leaves the blading with this relative velocity at an angle /3 equal to the discharge angle of the blading. Again, subtracting from w_2 the blade speed u, the absolute